

REMARKS

Claims 1 through 15 are now presented for examination. Claims 1 and 15 are the only independent claims.

Claims 10 and 12 have been objected to in that Claim 10 which depends from Claim 9 and Claim 12 which depends from Claim 11 recite "the second component" not claimed in Claim 9 or in Claim 11. These objections are respectfully traversed.

Objected-to Claim 10 depends from independent Claim 1 through intermediate Claims 8 and 9. Independent Claim 1 recites "a second component, which is not insolubilized by the first component and the coloring material . . ." so that the term "the second component" in Claim 10 has an antecedent basis in independent Claim 1. Similarly, Claim 12 depends from independent Claim 1 through intermediate Claim 11 so that the term "the second component" in Claim 12 has an antecedent basis in independent Claim 1. Accordingly, it is believed that each of Claims 10 and 12 properly recites the term "the second component".

Claims 1-10 and 13-15 have been rejected under 35 U.S.C. § 102(b) as anticipated by Nagai et al. (US 5,993,524). Claim 11 has been rejected under 35 U.S.C. § 103(a) as obvious over Nagai et al. in view of Tanimoto et al. (JP 2000-136336 A). Claim 12 has been rejected under 35 U.S.C. § 103(a) as obvious over Nagai et al. in view of Mihoya et al. (JP 07-034008 A). These rejections are respectfully traversed in view of the following remarks.

Pending independent Claim 1 is directed to an ink set having a coloring material in a dissolved state or dispersed in an aqueous medium and a water-based reactive liquid that contains a first component which insolubilizes or aggregates the coloring material in the ink by mixing

with the water based ink. The water-based reactive liquid contains a water-soluble high-molecular compound in a dissolved state and the water-based ink contains a second component not insolubilized by the first component and the coloring material in a dissolved state. The water-soluble high molecular compound is not insolubilized by the first component and the coloring material but is insolubilized by the second component.

Pending independent Claim 15 is directed to a water-based ink for use in a conducting ink-jet recording on a recording medium to which a water-based reactive liquid containing a water-soluble high-molecular compound and a first component that insolubilizes or aggregates a coloring material has been applied. The ink contains the coloring material in a dissolved state or dispersed in an aqueous medium and has a second component that insolubilizes the water soluble high-molecular compound.

In Applicants' view, Nagai et al. discloses an image recording arrangement that forms an image on a recording material using a recording liquid which contains a coloring agent and a solvent in which the coloring agent is dispersed or dissolved. A colorless or light colored image recording acceleration liquid containing a surfactant and a viscosity-increasing compound capable of increasing the viscosity of the recording liquid is applied to a recording material. The recording liquid is image-wise deposited on the recording material by ejecting the recording liquid in the form of droplets onto the recording material. An image recording apparatus carries out the image recording.

In accordance with the invention defined in independent Claims 1 and 15, a water based ink of an ink set contains a coloring material and a second component that insolubilizes a water-soluble high-molecular compound contained in a water-based reactive liquid. The water-based reactive liquid contains the water-soluble high molecular compound and a first component that insolubilizes or aggregates the coloring material contained in the water-based ink.

Advantageously, appropriate control of aggregation of a coloring material such that the aggregate of the coloring material is not localized on the surface of a recording medium, but exists in the interior of the recording medium and in the vicinity of the surface thereof is attained for high quality and high rub-off resistance.

Nagei et al. may disclose use of a recording liquid and an image recording acceleration liquid. In Nagei et al., however, (1) a water soluble resin which is a water soluble high-molecular compound is contained in the recording liquid but not in the image recording acceleration liquid and (2) inorganic ions (e.g., boric acid) which operates as a "second component" for forming a cross-linking structure with a viscosity-increasing assisting compound having hydroxyl group in the recording liquid is contained in the image recording acceleration liquid but not in the recording liquid.

In contrast to Nagei et al.'s arrangement of a recording liquid containing a water soluble high-molecular compound (water soluble resin) and an image recording acceleration liquid containing inorganic ions for cross-linking with the viscosity increasing assisting compound, it is a feature of Claims 1 and 15 that the water soluble high-molecular compound is contained in the water based reactive liquid and that the second component for insolubilizing the water soluble

high-molecular compound of the water based reactive liquid is contained in the water based ink. As a result, Nagei et al.'s arrangement of a water soluble resin in a recording liquid and inorganic ions for cross-linking in an image recording acceleration liquid provides an opposite construction to the arrangement of a water soluble high-molecular compound in the water based reactive liquid and the second compound in the water based ink of Claims 1 and 15. It is further noted that, in the present invention as opposed to Nagei et al., the first component (e.g., multivalent metal ions) for aggregating the coloring material and the water soluble high-molecular compound for impeding the aggregation are contained in the water based reactive liquid so that there is aggregation control to obtain uniform aggregation.

Accordingly, it is not seen that Nagei et al.'s water soluble resin in a recording liquid and inorganic ions for cross-linking in an image recording acceleration liquid in any manner teaches or suggests the features of Claim 1 and 15 of a water soluble high-molecular compound in a water based reactive liquid and a second compound for insolubilization of the water soluble high-molecular compound in the water based ink. It is therefore believed that pending Claims 1 and 15 are completely distinguished from Nagei et al. and are allowable.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

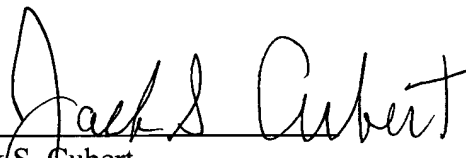
The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention,

however, the individual consideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' attorney, Jean K. Dudek, may be reached in our Washington, D.C. office by telephone at (202) 530-1010 All correspondence should continue to be directed to our address given below.

Respectfully submitted,



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